departs from the competitive ideal. As a result, public policy analyses often focus not on determining the precise number of firms necessary to achieve the competitive benefits of intense rivalry, but on whether or not specific changes in a market, particularly reductions in the number of firms or increases in market concentration, result in unacceptable threats to competition. For example, in enforcing the merger provisions of the antitrust laws, the Federal Trade Commission and the Antitrust Division of the Department of Justice evaluate whether a specific merger or acquisition is likely substantially to lessen competition.[5] We pursue this approach below in evaluating competitive conditions in the mobile telecommunications market.

The array of factors that must be taken into account in determining whether or not competition prevails in a market, and whether or not competition may diminish as a result of a reduction in the number of competitors, is quite broad. The analysis typically begins by defining the relevant product and geographic markets, and then evaluates the market's structure, principally the number and size distribution of firms. The key concern in focusing attention on these features of market structure is that, as the number of firms is reduced, the probability that the remaining firms can raise prices to consumers may be increased.

The analysis, however, does not stop there. Close consideration also is given to conditions of entry by new firms and expansion by existing ones, as well as to a variety of other factors that influence the conduct of firms. For example, even in markets that are relatively concentrated, if incumbent firms can expand, or new competitors can enter the market rapidly, firms will be unable for long to maintain prices at supracompetitive levels.

[5] "Department of Justice and Federal Trade Commission Horizontal Merger Guidelines," April 2, 1992, Bureau of National Affairs, Special Supplement. [Hereinafter "Merger Guidelines" or "Guidelines."]

If expansion or entry is easy and will occur rapidly in the face of high prices, high levels of concentration may still be consistent with competitive market performance. Moreover, even when market concentration is relatively high, firms may be unable effectively to coordinate their behavior and raise prices to consumers. Attempts by firms jointly to raise and sustain prices above competitive levels are limited by many factors, such as cost differences among them, differences in the range of products offered, rapid technical change in both products and services, and rapid market growth.[6]

If market conditions are changing rapidly, and are expected to continue to change rapidly in the future, the very fact of this market dynamism may prevent firms from coordinating their behavior and raising prices. In such circumstances, which are present in the mobile telecommunications market, even high levels of concentration may be acceptable, especially where economies of scale or scope permit larger firms offering a wider array of products or services to experience lower costs.

Analysis of the competitive consequences of changes in market structure -- reductions in the number of firms and increases in concentration -- proceeds in the following manner:[7]

- Market Definition and the Identity of Competitors. The relevant product and geographic markets within which the firms compete are defined, and the firms that compete in those markets are identified.

- Number of Competitors and Concentration. Within the relevant markets, the number of firms and levels of market concentration are summarized and evaluated by the computation of summary statistics, including the Herfindahl-Hirschman Index (HHI). If the concentration numbers are low by generally accepted standards, there is a

[6] Lawrence J. White ("Antitrust and Merger Policy: A Review and Critique," Journal of Economic Perspectives, 1, 13-22, Fall 1987, pp. 17-18) discusses some of the "other market characteristics" that are taken into account in the Guidelines.

[7] This description is patterned on the analysis outlined by the Merger Guidelines.

presumption that competition prevails, and that changes in concentration pose no material threat that competition will be harmed by a reduction in the number of competitors.

- Expansion and Entry. The ease with which existing firms may expand or new firms enter a market is evaluated. Even when market concentration exceeds generally accepted levels, the ability of existing firms to expand or new firms to enter may undercut the ability of existing firms to raise prices above competitive levels.

- Factors Inhibiting Coordinated Behavior. Factors that limit collusive behavior are assessed. When market concentration exceeds generally accepted levels, the ability of firms to coordinate behavior and raise prices above competitive levels may be inhibited by a large number of market characteristics. For example, sustained and rapid change in supply or demand, or both, may effectively prevent coordinated market behavior.

- Efficiencies. Economies of scale or scope that result when firms are combined are examined. Even where the risk of coordinated behavior is enhanced through merger, this factor must be weighed against the associated cost savings. Economies may result from increasing the output of the same product within a single firm (scale), or from combining the production of two or more products in a single firm (scope), or both. If these efficiencies are sufficiently great, they may more than compensate for the additional risk created by increased concentration.

We generally follow this approach in our analysis of competition in the mobile telecommunications market.

III. Defining the Mobile Telecommunications Services Market

We define the relevant product and geographic markets for mobile telecommunications services for several reasons. In particular, market shares and concentration typically have relevance only within economically meaningful markets. A predicate, therefore, to interpretation of shares and concentration is identification of the relevant markets within which mobile service providers compete. Moreover, the FCC has specified limits to the amount of bandwidth for which cellular companies may obtain licenses in the forthcoming PCS auctions. Analysis of the reasonableness of these restrictions on cellular company licensees requires identification of the relevant geographic markets. If, for example, geographic markets are broader than individual BTAs, so that shares and concentration within those regions have no economic significance, the strict limits on cellular company acquisition of PCS licenses might, in some locales, be relaxed without risking anticompetitive outcomes.

Basic Principles

Defining the product and geographic markets for mobile telecommunications services requires identification of the group of firms that determine the price of a specific service or group of services, and specification of the geographic regions within which prices are determined. Market definition precedes an analysis of how competition in the mobile telecommunications market is affected by the industry's market structure, or by a reduction in the number of competitors, or by an increase in concentration.

The Merger Guidelines provide a sound methodology for defining relevant product and geographic markets, and for identifying the competitors within those markets.[8] Basically, the Merger Guidelines pose a series of hypothetical questions, the purpose of which is to identify the narrowest group of products, and the smallest geographic region, within which sellers profitably could raise prices. In assessing market definition, one does not consider the identity of individual sellers. One simply asks whether, if a hypothetical single-firm monopolist raised the price of a product sold within a specific geographic region, that price increase would be profitable. If the hypothetical price increase would not be profitable, the implication is that many consumers must either have shifted their purchases to other products, or to the purchase of the same products sold by firms in other geographic regions. If enough consumers switch

[8] ¶¶ 1.1, 1.2, and 1.3 of the Merger Guidelines describe basic principles of market definition and identification of market competitors.

to competing products so that the hypothetical price increase is unprofitable, then the market must be expanded to include those other products; the relevant product market is broader than, and includes more products than, the tentative antitrust market. Similarly, if the price of a product sold in a specific region is raised but consumers switched their purchases to sellers in some other region, then the geographic market must be expanded to include these other suppliers. One has successfully identified the relevant product and geographic market only when the hypothetical price increase is profitable.

We can illustrate these principles with an example. Assume that there was a proposed merger between the only two Ford automobile dealerships in Alexandria, Virginia. Evaluating market definition would begin by posing the question of whether the merged firm profitably could raise the price of Ford automobiles sold in Alexandria. If, after raising the price, the Ford dealer found that it lost significant sales to other vehicle brands (Chevrolets or Hondas, for example) sold by dealers in Alexandria, so that the price increase was not profitable, the dealer would be forced to rescind the increase to counteract the loss in sales. One would conclude that the product market was broader than just Ford vehicles.

The Ford dealership in Alexandria might also lose sales to Ford dealerships in Arlington. If a sufficient number of buyers shifted to Ford dealers located outside of Alexandria so that the price increase was not profitable, then the geographic market would be broader than Alexandria, and would also include sellers in other regions.

To define the relevant product and geographic market, one would continue to add competing automobile brands and sellers in adjacent regions until the smallest group of firms that sold the product in the narrowest region that could profitably raise the price was identified.[9] In the example above, the relevant market might be the sale of some broad class of automobiles (all small and mid-sized cars, for example) in the entire Washington metropolitan area. The key issue in this, or any, market definition analysis is to identify the full range of sellers that might prevent the hypothetical monopolist from raising prices. If such constraints on pricing exist, the market is broader than originally proposed.

Note that the identification of the relevant product and geographic markets described above is based solely on the reaction of consumers to an assumed increase in price. However, competing firms may begin supplying a relevant product so rapidly that, although they do not now sell the product, they are, nonetheless, participants, or competitors, in the market. Under the Merger Guidelines, if, in the face of a price increase, a firm that does not currently produce and sell a product would likely begin to do so at low costs and within one year, then it is "in the market." If a firm is in a market through such supply response, then its capacity must be taken into account in evaluating the number of firms and market shares.

More technically, a firm that begins selling the product within one year must be able to switch its capacity to the production of that product without incurring significant sunk costs.[10] Sunk costs are costs that cannot be recovered if the firm subsequently decides to exit the

[9] Because of "chain reaction" effects, an analysis that begins by considering a limited set of products, or a narrow geographic region, may end up identifying broad product and/or geographic markets. For example, assume that the analysis above found that Alexandria could not be a relevant geographic market, and that the market had also to include Arlington. In the next round of analysis, one would hypothesize a price increase by auto dealers in both Alexandria and Arlington. That analysis might find that significant sales were lost to dealerships in Montgomery County. Thus, even though Alexandria, the locale of the merging firms, does not border Montgomery County, the two regions could be in the same relevant geographic market.

[10] See Merger Guidelines, ¶ 1.32. A supply response that requires more than one year and/or involves substantial sunk costs is considered separately in evaluating barriers to entry. See Merger Guidelines, ¶ 3.

business. Formally, the Merger Guidelines define markets solely on the basis of shifts in consumer demand. Firms that can enter a market rapidly, through supply-side flexibility and expansion, are taken into consideration in identifying the firms that participate in the market. However, because we believe that such supply-side flexibility is a key feature in the provision of mobile telecommunications service, we have included both demand- and supply-side flexibility in defining relevant markets. If the analysis is conducted properly, this distinction has no effect on the conclusions that are reached.

Continuing the example above, assume that, in evaluating only changes in demand, we found that the sale of Ford automobiles in metropolitan Washington constituted a relevant market (contrary to the common-sense notion that would have Fords competing with other brands). However, if other existing auto dealerships (that sold Hondas, for example) could begin selling Ford vehicles within one year without great cost, then those potential competitors would also be in the market, participating through supply response. Thus, even if there were only a few Ford dealers at the date of a merger, if other auto dealerships could rapidly and inexpensively begin selling Fords, those firms would also be included in the evaluation of market shares and concentration.

Price Discrimination and Market Definition

Under a Merger Guidelines analysis of relevant markets, the objective is to identify the smallest group of products and the narrowest geographic region in which a small price increase by a hypothetical monopolist would be profitable. However, even when a price increase imposed on all customers of a product would not be profitable, if sellers can raise prices to a more narrow or limited class of customers that cannot substitute away from the purchase of a product, the sale of the product to that specific group may be a relevant market. The ability to engage in price discrimination (price differences to different customers not justified by cost differences) may allow firms profitably to raise prices to a specific group of customers, e.g., small businesses in some region, or to all customers in a narrow geographic area. If this occurs, then such price discrimination may result in relevant antitrust product markets that are more narrow than would be the case if the sellers were required, either by competition or regulation, to charge the same price to all customers. In general, the greater latitude that suppliers have to charge different prices to different customers (either across products or regions), the narrower the relevant market. Price discrimination may thus affect the definition of both product and geographic markets.[11]

Section 202(a) of the Communications Act bars unreasonable discrimination among classes of customers and across geographic regions.[12] If the bars to discrimination embodied in Section 202(a) are enforced across broad classes of products and regions, relevant product and geographic markets will be broader than if such discrimination were permitted.

Defining the Product Market for Mobile Telecommunications Services

As CRA discussed in a previous paper,[13] PCS encompasses a potentially wide array of offerings. These consist of services that may directly substitute for one another, services the demands for which may be independent, and services that may be complements in demand.

[11]The Merger Guidelines address this issue at ¶¶ 1.12 (price discrimination in product market definition) and 1.22 (price discrimination in geographic market definition).

[12]47 U.S.C. Section 202(a).

[13]Besen, Larner, and Murdoch, "An Economic Analysis of Entry by Cellular Operators in Personal Communications Services," November 1992.

Because many of these services are likely to be new, uncertainty about precisely which services will be offered under the rubric of PCS adds to the usual difficulties in defining product markets. That is why, in CRA's earlier paper, we conducted a "worst case" analysis, by assuming that PCS simply refers to cellular telephone service. We then asked how modifying this assumption about which services would be offered in the 2 GHz band would change our conclusions about the competitiveness of the mobile telecommunications market.

The problems of market definition from the demand side are no less formidable today than they were a year ago. At the same time, however, we believe that it is possible to define the mobile telecommunications services market in much the same way we had in our earlier analysis, not by focusing on the demand for services the identities of which are still largely unknown, but by considering the supply side of the provision of these services. As noted above, the Merger Guidelines indicate that one should employ only demand-side factors in defining antitrust markets, introducing supply-side substitution only later as an additional consideration. However, the nature of mobile services suggests that a better approach here is to introduce supply-side substitutability directly in the process of market definition.

Because we now have information that was not available to us at the time we submitted our original paper, we can perform a more refined version of our previous analysis. Moreover, the outlines of the Commission's PCS plan have been announced, so that we can direct our analysis specifically to that plan rather than to hypothetical alternatives. In particular, we consider whether to include all providers of mobile telecommunications services in the same market, and evaluate competition in the market under that definition.

Conditions for a Single Mobile Telecommunications Services Market

Under reasonable conditions, all mobile telecommunications licensees — including those providing cellular, PCS, and Specialized Mobile Radio services — should be considered to be in the same antitrust market. Moreover, under these conditions, the capacity of each firm to transmit information over its bandwidth, without regard to the uses to which that bandwidth is put, is the correct measure of firm shares, and market concentration can be measured using these shares.[14] This section discusses the conditions under which market definition and concentration measurement can be carried out in this manner. It also considers how market definition and concentration change if the conditions described here are not met.

To anticipate our conclusion, we find that it is reasonable to treat all firms that provide mobile telecommunications services as being in the same antitrust market. The key to this conclusion is that providers are legally able rapidly to move among the provision of various services, and can do so at modest cost. If all firms can easily offer a wide range of services, they are in the same market. The remainder of this section discusses the conditions supporting this conclusion.

Absence of Legal or Regulatory Restrictions on Spectrum Use. The first condition is that there are no legal or regulatory restrictions on the uses to which the spectrum licensed to any firm can be put. If there are no restrictions on spectrum use, and the other conditions discussed below are also met, a licensee can shift from the provision of one service to another in response

[14] As discussed in detail below, there is not a one-to-one relationship between bandwidth and capacity. The capacity to transmit information is a function of both bandwidth and the technology used; analog technologies are inherently less capable than digital technologies. Capacity is based on effective bandwidth.

to an increase in prices. The absence of legal restriction is, therefore, necessary for all mobile service operators to be included in the same market.

Suppose, to the contrary, that FCC rules restricted the use of a particular portion of the spectrum to a specific mobile service, say, paging. In these circumstances, providers of paging services using that portion of the spectrum could not constrain price increases by, for example, mobile telephone carriers, because these providers of paging could not provide telephone service in response to a rise in its price.

It should be noted, however, that even if legal restrictions prevented <u>some</u> suppliers of paging service from shifting to providing telephone service, it may still be appropriate to include <u>other</u> (unconstrained) suppliers in the broader market for mobile telecommunications services. That is, if some providers of paging services are not constrained by regulation in the use to which they put their spectrum assignments, these suppliers <u>could</u> shift to providing telephone service if suppliers of telephone service were to attempt to raise their prices. Moreover, in the example, all mobile telephone service licensees are in the paging services market if they are not legally prevented from providing such services. If legal restrictions work in only one direction — that is, if mobile telephone service providers can provide paging services but not <u>vice versa</u> — there is no antitrust market for paging services that is distinct from other mobile services.

In fact, the Commission has defined PCS so broadly that the type of legal encumbrances considered here will not be present.[15] Unlike past instances in which FCC regulations have

[15] <u>Second Report and Order</u>, ¶¶ 19-24.

prevented the shift of spectrum from one use to another in response to opportunities for greater profit.[16] the provision of mobile services is today largely free of such restrictions.[17]

Bandwidth Fungibility. The second condition for the inclusion of all mobile telecommunications service providers in the same market is that all portions of the electromagnetic spectrum that have been allocated to the provision of mobile telecommunications services can be used to provide all of the same services and at about the same cost. If this condition is satisfied, an attempt on the part of any operator, or small group of operators, to raise the price of a particular mobile service would induce other providers to shift a portion of their capacity to the provision of that service, and to do so rapidly and at low cost. The effect would be to constrain the attempted price increase.

To the extent that particular portions of the spectrum are especially well-suited to the provision of particular services, it would be appropriate to define mobile service markets more narrowly. Thus, for example, if high-speed data services could be provided in the band allocated to cellular but not in the 2 GHz band, PCS providers could not shift capacity to the provision of those services to counteract a price increase. In these circumstances, PCS providers would not be in the high-speed data market.[18]

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[16] A classic example is the inability to shift spectrum in the UHF band from the provision of television services to the delivery of mobile telecommunications services. Some spectrum was eventually shifted but only after a prolonged regulatory delay.

[17] This is a key change from past FCC practice. Indeed, the Commission has recently modified the licenses of cellular operators to permit them to offer PCS, and recent changes in the policies with respect to SMR permit these operators to compete for PCS customers. See, for example, Second Report and Order, ¶¶ 20 and 111.

[18] An intermediate case is one in which the cost of providing the service in the 2 GHz band is greater than that in the cellular band. Moreover, as in the previous discussion, a given market could include some firms not currently supplying a particular service even if other firms cannot easily shift the services they offer.

It appears that those technical differences that do exist among the portions of the spectrum allocated to mobile telecommunications services are not so significant as to prevent firms operating in each portion of the spectrum from offering a similar array of mobile services at similar cost.[19] As a result, in the analysis that follows we treat the spectrum allocated to SMR, cellular radio, and PCS as if they are essentially fungible.[20]

Provider Equipment Flexibility. The third condition is that the equipment used to provide one type of mobile service, say telephone service, can, in a relatively brief period of time, be shifted to the provision of any other service, say paging. If this condition is satisfied, an attempt on the part of the providers of a given service to raise prices will be limited by the ability of the providers of other services to shift a portion of their capacity to the provision of those services whose prices have risen.[21]

Whether this condition will be met is determined both by the type of equipment that is available and by the choices made by mobile service providers. That is, equipment manufacturers must provide equipment that can be used to provide more than one service, and

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[19]We are aware of no PCS that could, for example, be made available in the 2 GHz band and not in the cellular band, and vice versa.

[20]This does not mean that we assume that all portions of the spectrum assigned to mobile services are identical in their physical characteristics, but only that the economic differences among them are not great. For example, radio waves in the cellular band travel longer distances and penetrate buildings more easily than do those in the 2 GHz band. However, these advantages are offset somewhat by the design of cellular systems in the higher band, which will permit greater frequency reuse and less expensive receiving sets because cell sites will be located closer together.

[21]Note that, under the terms of the Second Report and Order (¶ 134), PCS competitors are required to build systems to serve specific portions of the population in service areas according to a fixed schedule. The issue in evaluating equipment flexibility is not, therefore, whether or not the equipment will be installed, but whether it will be capable of delivering a wide range of mobile services.

PCS providers must choose to employ such multi-service equipment.[22] Existing equipment is capable of providing some data services in addition to voice transmission, and equipment flexibility will be enhanced in the future by the introduction of Cellular Digital Packet Data (CDPD) modules.

The significance of this condition is that not only must the available spectrum be both highly fungible and unencumbered by regulation, it must also be capable of being transferred from one use to another relatively rapidly and at relatively low cost if the market is to be defined broadly to include all providers of mobile telecommunications services.[23]

Minimum Spectrum Requirements. The provision of mobile telecommunications services requires at least some minimum bandwidth, and the amount of bandwidth needed differs among services. For example, paging services require relatively little bandwidth, voice service more bandwidth, high-speed data transmission still more, and video transmissions demand even more bandwidth. As a result, the ability of a provider to shift from one service to another depends on whether it has sufficient bandwidth, or can acquire that bandwidth, to offer the new service.

If, for example, a paging service provider has sufficient bandwidth to shift to the provision of voice service, we would consider the paging operator in a broader market that

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[22] In the alternative, one could have single-use equipment where a portion of the equipment is, or must be, replaced each year. In such circumstances, the market is defined more broadly than a particular mobile service because the choice of new equipment will reflect then-prevailing market conditions.

[23] "Rapidly" does not mean "instantaneously" and "low cost" does not mean "no cost." In terms of the Merger Guidelines, flexibility must be sufficiently great to prevent a significant and non-transitory increase in price by the suppliers of other services. See Merger Guidelines, ¶ 1.32. To the extent shifting into the provision of a new service takes longer (say, more than one year), or expenditure of significant sunk costs, these factors are taken into account in evaluating new entry into a market. If expansion into a new service would occur rapidly, albeit with more delay than the rapid response needed to include the firms in the same market, such entry would act to mitigate antitrust concerns that might be based on high market shares and concentration alone. See Merger Guidelines, ¶ 3.

includes the providers of voice service.[24] Moreover, even if no single paging provider had sufficient bandwidth to offer voice service, if the bandwidth available to a number of different providers could be combined relatively quickly, the bandwidth of all paging providers would be included in the broader market.

This is, of course, what is occurring through the consolidation of Special Mobile Radio licenses. Recent transactions include NexTel's acquisition of radio dispatch units of Questar and Advanced MobileComm as well as an ownership interest in CenCall Communications,[25] the recent acquisition of a significant number of Motorola's mobile radio licenses by CenCall and Dial Page,[26] and the pending merger of Dial Page and Transit Communications. One report notes that

> ...the deals will propel NexTel, CenCall, and Dial Page to the top of the mobile radio market, and almost certainly hasten their creation of a coast-to-coast network enabling customers to carry wireless handsets anywhere they travel.[27]

Customer Equipment Flexibility. Even if mobile telecommunications service providers can shift easily among services, so that there is substantial supply-side flexibility, there may be a concern that some users who employ equipment suited only to a single band can become "captive" customers of their suppliers. That is, although other suppliers can switch capacity to

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[24] Conversely, of course, the voice service provider has sufficient bandwidth to offer paging service.

[25] G. Naik, "Nextel to Buy Dispatch Units of 2 Concerns," Wall Street Journal, October 19, 1993, A6.

[26] G. Naik and M.J. Ybarra, "Motorola to Sell 42% of Licenses in Mobile Radio," Wall Street Journal, October 25, 1993, A2.

[27] Id.

serve them, they may be unable to make use of that capacity because of the equipment they employ.[28] Whether this raises a serious concern depends on a number of factors.

First, customers may be able, at some additional cost, to purchase receivers that are capable of operating in both the cellular and PCS bands. We are informed that such equipment can be made available, albeit at higher cost. Customers with such equipment cannot be captives. Second, if consumers anticipate that they may at least be partially "locked in" after they make equipment purchases, they may insist on price guarantees or other consideration to reduce the likelihood that they will subsequently be exploited. For example, market competition could result in consumer equipment being supplied by service providers. Third, if the cost of purchasing a new handset is small relative to the annual cost of the service, consumers' "sunk costs" will be a relatively minor factor tying customers to particular operators. Moreover, suppliers using different technologies may compete by offering discounts, or payments to cover "switching costs." Finally, if price discrimination among customers is not permitted, even apparently captive customers can face competitive prices. This arises because providers who compete for new customers must offer the same favorable terms to continuing ones.[29]

Technical Change. Product market boundaries are likely to be affected by technological developments. For example, a provider of paging services that had previously not been considered in the broader mobile telecommunications services market because it lacked sufficient bandwidth to offer voice service would be included if the use of digital technology permitted it to do so. A combination of the shift to digital technologies, the use of compression techniques,

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[28]This issue arises in any market in which consumers employ equipment that is specialized for a particular set of vendors.

[29]The importance of this factor depends on the flow of new customers into the market.

and the use of smaller cells is breaking down barriers that had previously separated markets, so that we appear to be moving rapidly to a single market in which many firms can offer a wide array of mobile services using the spectrum currently assigned to them.

Demand-Side Substitutability. Although our analysis emphasizes the ability of mobile telecommunications service providers to provide different types of services -- what is generally called supply-side substitutability -- we do not wish to underplay the fact that, for some services, users can substitute one mobile service for another.[30] For example, paging, combined with a return telephone call using the wireline system, may be a substitute in some circumstances for a mobile telephone call. Moreover, for some types of advanced paging, in which brief messages are displayed, there may be no need for the return call. In these circumstances, paging and telephone providers may compete directly for the same customers providing somewhat imperfect substitutes at presumably different prices. If, for example, an increase in the price of cellular telephone service causes a substantial number of subscribers to substitute paging services, both sets of providers would be in the same antitrust market.

Summary - Product Market Definition

In summary, so long as the conditions outlined above hold, the appropriate product market for antitrust analysis of mobile telecommunications services is very broad, encompassing all such services. Under these conditions, there would be few, if any, narrow markets limited to the provision of individual mobile telecommunications services.

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[30] Of course, there are also some substitution possibilities between mobile and wireline services.

Defining the Geographic Market for Mobile Telecommunications Service

Current FCC plans are to auction off licenses to use portions of the PCS spectrum for varying geographic regions. Of the 120 MHz of bandwidth for which licenses will be auctioned, Channels A and B (30 MHz each) will be made available for broad geographic regions identified by Major Trading Areas (MTAs); the remaining 60 MHz (one license for the use of 20 MHz and four licenses for the use of 10 MHz each) will be auctioned off for far more narrow Basic Trading Area (BTA) regions.[31] Thus, the operating regions for firms competing in any given area will differ, and there is no way to know *a priori* precisely how those territories will overlap. Moreover, it would be serendipitous indeed to find that the operating regions of incumbent cellular operators were coincident with either a BTA or a MTA.

The Merger Guidelines direct attention to the narrowest geographic region within which price might be increased. Thus, in light of the FCC's intention to auction PCS rights within relatively narrow BTAs, these areas are the logical starting point for evaluating the relevant geographic market. The analysis begins by inquiring whether or not a price increase attempted by all sellers in a given BTA would be profitable.

The answer to this question depends heavily on whether firms in the BTA may charge different prices to customers in that narrow region from those charged to customers in other geographic regions where these firms also offer mobile telecommunications services. If mobile service suppliers could discriminate between customers in the BTA and those in other locations, the geographic market would be coincident with the BTA since, if the firms in the BTA raised prices, no competitor from outside the region could begin selling to customers in the area, and

[31] Second Report and Order, ¶¶ 56 and 76. There are 51 MTAs and 492 BTAs. On average, there are 9.6 BTAs per MTA.

customers in the BTA would be limited in their ability to subscribe to mobile service providers outside the BTA by the higher. roaming charges they would pay for local calls.[32] If mobile systems providers were allowed to, and chose to, discriminate in setting prices in narrow geographic regions, like BTAs, then those narrow regions would generally constitute relevant geographic markets. If, however, the firms could not discriminate, and therefore had to charge the same price to all customers in some broader region (the entire MTA, for example), then in many, if not most, instances, the relevant geographic market would be broader than the BTA.

For example, assume that each provider in the Greensboro-Spartanburg BTA (G-S) raised the price of mobile telecommunications services. The profitability of the hypothetical price increase depends crucially on what prices the firms in G-S charge to customers outside the area. At least two of the firms operating in that BTA (those firms that were awarded Channels A and B — 30 MHz each) also will provide mobile services in the other 22 BTAs in the Charlotte-Greensboro-Greenville (C-G-G) MTA. If the firms in the G-S BTA also raised prices to customers in all of those other BTAs, any added profits they would earn after raising prices in G-S would be offset, and likely overwhelmed by, the losses they suffered through foregone sales and profits to rivals in the other BTAs, which are assumed to hold their prices at the initial, lower levels.[33] Since the G-S BTA has only about 8 percent of the total population of the C-G-

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[32]Some customers on the fringe of two regions may be able to select between suppliers in more than one BTA. The economic significance of this option for market definition depends on the proportion of the population residing in these fringe areas. The larger the portion of consumers in fringe areas, the more likely it is that the market will be broader than an individual BTA. We assume here (allowing for price discrimination) that the consumers in such regions would not be so numerous as to result in markets broader than the BTA.

[33]In defining geographic markets, one assumes that the price is raised in the provisional market but that prices in the surrounding areas remain the same. Thus, if the price of mobile services in the G-S BTA is raised, the prices of other suppliers in other BTAs, Charlotte, for example, are assumed to remain constant. Since some firms in G-S must also raise prices in Charlotte (because of the ban on price discrimination), they will lose business to competitors in Charlotte that do not raise prices. It is, of course, possible that exactly the same group of firms will

G MTA, the lost revenues and profits suffered by those firms in the rest of the MTA would likely greatly outweigh the possible profit increase in G-S.

Current cellular operators in some BTAs would be similarly affected. Because cellular company service territories are not necessarily coincident with BTAs, those cellular operators that raised the price in a specific BTA, in addition to having to raise the price in other areas (while rivals in the other areas held prices constant), would lose sales and profits in the same manner as described above.

Of the 170 MHz of bandwidth (not including SMR) allocated to mobile telecommunications services, firms controlling at least 110 MHz will either operate throughout a MTA (firms with Channels A and B — 60 MHz) or may operate in some region different from a BTA (cellular operators — 50 MHz). Moreover, some of the remaining mobile service providers operating in Channels C through G, which are allocated by the BTA, may also operate in some other BTA within each MTA, and thus may also be subject to loss of business and profits if they raise prices. Thus, the share of the capacity of firms in each BTA that is affected by this potential loss of business is quite large. We conclude that, if firms were barred from discriminating in price across a MTA, many BTAs would not be relevant geographic markets; the appropriate market would encompass a larger region.[34]

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compete in each of the BTAs in the C-G-G MTA. If that were true, then in evaluating any individual BTA, mobile service prices would increase not only in the BTA, but also throughout the MTA. This means that the firms in the BTA would not lose business to competitors that held prices at the initial lower levels in other regions. In these circumstances, since the price has risen throughout the MTA, the MTA would be the relevant geographic market. Our analysis assumes that the rival sellers in surrounding BTAs (that do not raise prices) have the capacity to serve customers in those regions that would switch if prices of some mobile service suppliers were to rise.

[34]It is possible, of course, that an individual BTA could be a relevant geographic market. There may be situations where the population in one BTA is so large that the firms in that BTA would find a price increase profitable. Because such a large portion of the population would be affected by the hypothetical price increase, losses in other areas would not offset those gains. For example, the Houston BTA has about 78 percent of the

If a BTA that is initially proposed is rejected as a relevant geographic market, the next step is to expand the region considered to include other BTAs and repeat the analysis. For example, one would next add an area adjacent to G-S, and repeat the test. One might, for example, evaluate the G-S and the adjacent Columbia, SC BTAs together. This combined region, however, has only about 14 percent of the population in the MTA. Raising prices in the G-S and Columbia BTAs would force the firms that compete across the entire MTA to operate at a competitive disadvantage, and lose profits, in all other BTAs in the C-G-G MTA, including, among others, Charlotte (17 percent of the population), Greensboro-Winston Salem-High Point (13 percent), and Raleigh-Durham (11 percent). It is highly unlikely that a firm that has an obligation to operate a system, and incur expenses, in the entire MTA would find such a price increase profitable. Cellular firms that operated in overlapping areas would be similarly affected. Even this expanded region, encompassing two BTAs, is unlikely to be a relevant geographic market.

At some point, as the proportion of population in the proposed market increases relative to the population of the MTA — as the number of BTAs is increased — a hypothetical price increase likely would become profitable.[35] As the portion of business in the candidate area increases, the added profit from the price increase outweighs lost profit in other areas. This area need not encompass an entire MTA; it would however, likely encompass a substantial portion of the MTA, an area substantially larger than the average BTA.

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population within the Houston MTA, so that the Houston BTA alone might be a relevant geographic market.

[35]We assume here that any bar to price discrimination is enforced across an MTA. If firms may not discriminate across even broader regions, the relevant geographic market may be even larger than an MTA.

We conclude that the relevant geographic market for mobile telecommunications services will generally be larger than a BTA. Firms operating in a single BTA will typically find it unprofitable to raise prices in that BTA alone. Thus, in the absence of price discrimination, relevant geographic markets will encompass areas larger than a BTA, and market shares and concentration computed for areas that are not meaningful markets have no economic significance, as they do not provide a measure or gauge of market power. By imposing limits on the bandwidth that cellular companies may acquire in the forthcoming auction, the Commission must implicitly be assuming that narrow geographic markets exist. They must, therefore, also be assuming that mobile systems providers may discriminate in their pricing to subscribers in narrow geographic regions, because, in the absence of discrimination, such narrow regions cannot be relevant markets. We return to this important issue when we evaluate the reasonableness of the Commission's current limitations on the share of bandwidth that may be licensed to cellular operators.

IV. Antitrust Analysis of the Number of Firms, Market Shares, and Concentration

The number of firms, the shares they hold, and measured concentration are key features of market structure. Generally, economists believe that the larger the number of firms, and the lower their individual market shares, the more likely competition will prevail. Conversely, as the number of firms declines and their shares increase, the likelihood increases that the firms may be able, either individually or as a group, to raise prices above competitive levels. Thus, mergers and acquisitions, because they typically increase individual shares and measured concentration, are closely scrutinized to determine whether a specific transaction poses a material threat of reducing competition and allowing prices to increase.

There is, however, no simple, hard-and-fast rule concerning whether a particular level of industry concentration short of a merger to monopoly will lead to non-competitive outcomes. The ability of a group of firms to raise prices is materially affected by many factors in addition to market structure. Because these factors influence how competition works in specific markets, concentration is only one factor, albeit an important one, in evaluating the effect of mergers and acquisitions.

The 1992 Merger Guidelines reflect current standards adopted both by the Federal Trade Commission and the Antitrust Division of the Department of Justice for evaluating mergers and acquisitions. The Guidelines use the Herfindahl-Hirschman Index (HHI) to measure market concentration. The HHI is calculated by summing the squares of the individual market shares of all market participants. For example, in a market with 10 firms, each of which had a market share of 10 percent, the HHI would be 1000.[36] A market consisting of seven firms, with two firms having shares of 25 percent each and the remaining five firms having shares of 10 percent each, has an HHI of 1750.[37] The Guidelines identify different criteria in evaluating mergers, depending on the level of concentration, as measured by the HHI, that prevails after the transaction.

> Post-Merger HHI Below 1000. Market is unconcentrated. Mergers are unlikely to have adverse competitive effects. No further analysis is required.

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[36] Each firm's share of 10% would be squared (10 x 10=100), and the resulting numbers added together. In this case, each of the 10 firms' contribution to the HHI is 100; the HHI itself, therefore, is 1,000.

[37] Each of the two firms with 25 percent contributes 625 to the HHI (25 x 25 = 625), and the remaining five firms contribute 100 each (10 x 10 = 100); the HHI totals 1750.

> Post-Merger HHI Between 1000 and 1800. Market is moderately concentrated. Mergers that produce an increase in the HHI of less than 100 points are unlikely to have adverse competitive effects. No further analysis is required. Mergers that produce an increase in the HHI of more than 100 points may raise competitive concerns depending on factors set forth elsewhere in the Guidelines.
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> Post-Merger HHI Above 1800. Market is highly concentrated. Mergers that produce an increase in the HHI of less than 50 points are unlikely to have adverse competitive effects. No further analysis is required. Mergers that produce an increase in the HHI of more than 50 points may raise competitive concerns depending on factors set forth elsewhere in the Guidelines. Mergers that produce an increase in the HHI of more than 100 points are presumed to enhance market power or facilitate its exercise. However, this presumption may be overcome by a showing that factors enumerated elsewhere in the Guidelines make such exercise of market power unlikely.[38]

The Guidelines also state that, in some circumstances, a merger that results in a firm with a market share of 35 percent or more may confer on that firm the ability unilaterally to raise prices.[39]

As discussed in more detail later (see Section VI), the key factors in addition to concentration to which the Guidelines direct attention include conditions that facilitate or inhibit collusion or cooperation among firms, e.g., the ability to detect and punish a firm's deviation from a collusive agreement; the possibility of expansion by existing firms; and entry by new competitors. Broadly, the focus is on the ease or difficulty of collusion among existing firms, and on the ability of existing firms to expand, or new firms to enter the market, to undercut or defeat any attempt to raise prices to consumers to noncompetitive levels.[40]

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[38]Merger Guidelines, ¶ 1.51.

[39]Merger Guidelines, ¶ 2.22. The Merger Guidelines leave open the possibility that mergers that otherwise might be challenged may be allowed if the transaction is necessary to achieve otherwise unattainable efficiencies. See ¶ 4.

[40]Merger Guidelines, ¶¶ 2 and 3. Franklin M. Fisher ("Horizontal Mergers: Triage and Treatment," Journal of Economic Perspectives, 1, 23-40, Fall 1987, p. 31), observes that "while the HHI seems a reasonable way to measure concentration, neither theory nor reliable econometric evidence shows that the HHI is a sufficient statistic for determining the effects of concentration on noncompetitive behavior." Elsewhere ("Diagnosing Monopoly,"

This summary of the market structure standard enunciated by the Merger Guidelines permits several important observations. The numerical HHI standard that is applied to evaluate whether or not a transaction threatens to harm competition is not a single number, but varies depending on market circumstances. In moderately concentrated markets (HHI between 1000 and 1800), only transactions that increase the HHI by more than 100 points require further analysis, and, even if the increase is significantly greater than 100, reflecting a "large" increase in concentration, the acquisition may still not be viewed as harmful to competition. While the standard for evaluating increases in concentration becomes more stringent when the post-merger HHI is above 1800, even in such cases there is a presumption that small increases in concentration (HHI change of less than 50) will not harm competition. Moreover, transactions involving quite large increases in concentration (HHI change exceeding 100) may be permitted if certain other factors are present.

Finally, the standard for evaluating when a single firm's share raises competitive concerns is quite high — 35 percent. Thus, a merger that results in a single firm share of less than 35 percent (so long as it does not run afoul of the overall HHI standards) is not treated as anticompetitive.

The 1992 Merger Guidelines incorporate revised standards from those that had been issued in the 1980s.[41] The 1992 Guidelines relaxed certain portions of the merger standards,

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Quarterly Review of Economics and Business, 19, Summer 1979, reprinted in Industrial Organization, Economics, and the Law, John Monz (ed.), Cambridge, MA: MIT Press, 1991, p. 15), Fisher observes that "...the one proposition which most people believe is that a small share shows the absence of monopoly power and a large share its presence....This is not true. The right question is that of what happens to share...when monopoly profits are sought. The fundamental question is whether competitors are able to grow."

[41] The first Merger Guidelines were issued by the Department of Justice in 1968. Guidelines incorporating a substantially different framework and set of standards were issued in 1982. At about the same time (in 1982), the Federal Trade Commission issued its own "Statement Concerning Horizontal Merger Guidelines." The DOJ revised